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SUNSHINE TEST REPORT FOR THE AN/TRN-41 TACAN NAVIGATIONAL SET

(11) 12 Aug 77

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Prepared for:
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Headquarters Electronic Systems Division (AFSC)
Hanscom Air Force Base
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18. SUPPLEMENTARY NOTES

19. KEY WORDS *(Continue on reverse side if necessary and identify by block number)*

AN/TRN-41 TACAN Navigational Set

20. ABSTRACT *(Continue on reverse side if necessary and identify by block number)*

This report describes the sunshine test as defined in the Equipment Test Plan for Navigational Set, TACAN, AN/TRN-41.

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SUNSHINE TEST REPORT

for the

NAVIGATIONAL SET, TACAN, AN/TRN-41

This report describes the sunshine test as defined in the Equipment Test Plan for Navigational Set, TACAN, AN/TRN-41, 131500-415.

1. Test Identification. Sunshine test as defined in Appendix IV-G (sunshine test procedure) of the Equipment Test Plan for Navigational Set, TACAN, AN/TRN-41.

2. Functional Purpose of Test. This test forms a part of the AN/TRN-41 system qualification tests.

3. Test Objectives. To demonstrate that the AN/TRN-41 will meet the sunshine requirements of paragraphs 3.2.5.1.8 and 4.2.1.4.3.9 of Specification No. 404L-701-5017A, Part 1 of 2 parts (20 August 1976).

4. Description of Test Article. The AN/TRN-41 system consisting of the following was used for the tests:

Receiver-Transmitter	RT-1202/T
Antenna	AS-3132/T
Antenna Support	AB-1237/T
Filter, DC Power	F-1439/T
Interconnecting Cables	

5. Summary of Test Results. The AN/TRN-41 showed no functional or physical degradation during the sunshine test.

6. Description of Test Facilities and Procedures. The test facilities and test procedures are described in Appendix IV-G of the Equipment Test Plan.

7. Test Setup Diagrams. The test setup diagrams are provided in Appendix IV-G of the Equipment Test Plan.

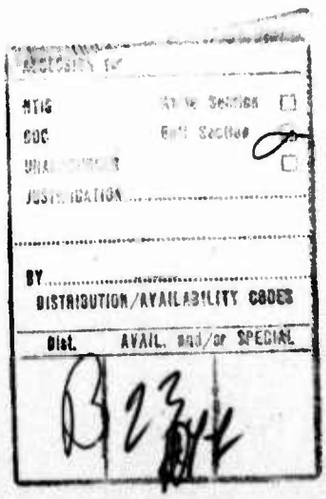
8. Test Equipment. See Attachment 1 for test equipment used for the sunshine test and the pretest, and post test operational tests.

9. Test Data. Attachment 2 contains the data sheets for the sunshine test, pretest, and post test operational tests and the chamber data sheet.

10. Test Conditions. The system was subjected to radiant energy of 100 to 120 watts per square foot for 48 hours with chamber temperature maintained at 45°C.

11. Test Results Analysis. Comparison of pretest and post test operational data and visual inspection showed no functional or physical degradation of the system during the sunshine test.

12. Certification. The data sheets shown in Attachment 2 have been signed by a Montek Quality Assurance representative and a DCAS representative, certifying that the test results are authentic, accurate, current and in accordance with the related test plan.



ATTACHMENT 1
TEST EQUIPMENT

TEST EQUIPMENT

Description/Manufacturer	Model	Calibration Due Date
Oscilloscope, Tektronix	465	7/6/77
Signal Generator, RF, H.P.	612A	6/23/77
Peak Power Meter, Boonton	8900B	9/19/77
Pulse Generator, Data Pulse	110B	5/12/77
Counter, Fluke	1953	8/12/77
Half-Ampl. Det. Montek	131500-702	N/A
RF Detector, Montek	135203-100	N/A
Monitor Ant., Montek	006300	N/A
Test Box - Interconnection - Montek	131500-703	N/A
Power Supply HP	6274B	1/16/78
Power Supply Acopian		12/9/77
Power Supply, Sorensen	QR40?5A	9/19/77
Directional Coupler 20 dB, Narda	3042B	N/A
Directional Coupler 10 dB, Microlab	CBA-78	N/A
Variable Attenuator, Weinschel 0-10 dB	905	N/A
RF Attenuator, Weinschel	10 dB	N/A
Multimeter, Fluke	8120A	8/2/77
Humidity, Chamber, Conrad	WD-640-705	9/2/77

ATTACHMENT 2

DATA SHEETS

APPENDIX IV-K

DATA SHEET
ENVIRONMENTAL TEST

TEST Sunshine

SYSTEM 003

DATE from 14 May 1977 to 16 May 1977

ACCEPTABLE X

NOT ACCEPTABLE

REMARKS The sunshine test was performed as outlined by Appendix IV-G of Equipment Test Plan 131500-415. The test data was compared with the pretest data; there was no degradation in performance noted. There were no defects noted as a result of visual-mechanical inspection.

DISCREPANCIES

SIGN OFF INFORMATION

ENVIRONMENTAL TEST ENGINEER _____ DATE _____

REPRESENTATIVE ENGINEER B D Daylon DATE 5-17-77

QA REPRESENTATIVE Wm B. Grant DATE 5-17-77

DCASD OR AF CONCURRENCE M M Black DATE 5-17-77

June 30, 1976

DATA SHEET

OPERATIONAL TESTS

AN/TRN-41

Test SUNSHINE

System 003

Date 5-10-77

Time 0900

Tech: [illegible]

Para. No.	Description	5-10-77 Pre Test mbl	Test	5-16-77 Post Test mbl	Requirements	Units
6.1	Calibrated RF insertion loss P_L = 31.2 dB Used in determining RF peak power.	N/A	N/A	N/A	N/A	N/A
6.2	System turn on normal operation	✓		✓	Check if OK	N/A
6.3.1	Antenna radiated signal 15 Hz	✓		✓	Check if OK	N/A
	135 Hz	✓		✓	Check if OK	N/A
6.3.2	Antenna Speed	66.668		66.669	66.667 ± .133	ms
6.4.1.1	Correct identity code	✓		✓	Check if OK	N/A
6.4.1.2	Identity period	38.0		38.0	37.5 ± 3.75	Seconds
6.4.2	Peak power (1) Reading of peak power meter Pm =	76mw		76mw	N/A	Watts
	(2) Convert to dBm - 10 log Pm x 10^3 = Pm dBm	18.81 dBm		18.81 dBm	N/A	dBm
	Total power output in dBm $P_{mdBm} + P_L$ = *Insertion loss see 6.1 above.	50.01 dBM		50.01 dBM	50 dBm	dB
6.4.3.3	Pulse count	7189		7180	7200 ± 180	Counts
6.4.4.2	Pulse shape Width (50%)	3.6 μs		3.6 μs	3.5 ± 0.5	μs
	Rise time (10-90%)	2.1 μs		2.1 μs	2 ± 0.25	μs
	Fall time (90-10%)	2.5 μs		2.5 μs	2.5 ± 0.5	μs
6.4.4.4	Pulse spacing	12.0 μs		12.0 μs	12.0 ± 0.1	μs
6.4.5.2	Delay - 60 ±10 μs 15 Hz trig to first burst pulse.	✓		✓	Check if OK	

DATA SHEET

OPERATIONAL TESTS

AN/TRN-41 (Continued)

Para. No.	Description	Pre Test	Test	Post Test	Requirements	Units
.4.5.3	Correct north Burst - 12 pulse pairs spaced 30 ± 0.1 μs	✓		✓	Check if OK	
.4.5.5	Delay 40 ± 10 μs - 135 Hz trig to first burst pulse	✓		✓	Check if OK	
.4.5.6	Correct Aux burst - 6 pulse pairs spaced 24 ± 0.1 μs	✓		✓	Check if OK	
.4.6.5	RT replies to 3300 interrogations	2560		2680	≥ 2310 (Counts/Second)	
.4.6.7	Demand only mode - times to switch from ON to STBY within ~~70~~ 80 seconds	✓		✓	Check if OK	✓
.4.6.8	STBY mode	✓		✓	Check if OK	
.4.6.9	Demand Only mode - time to switch from STBY to ON ≤ ~~15~~ 20 sec — 4/19/77	✓		✓	Check if OK	
.4.6.10	ON AIR mode	✓		✓	Check if OK	
.4.7.1	DME ONLY mode	✓		✓	Check if OK	
.4.7.2	Switch from DME to TACAN	✓		✓	Check if OK	
.4.8.1	Antenna Alarm - Within four seconds	✓		✓	Check if OK	
.4.8.2	Alarm Reset	✓		✓	Check if OK	
.4.8.3	RT Alarm - Within five seconds	✓		✓	Check if OK	
.4.8.4	Alarm Reset	✓		✓	Check if OK	

E 3113A.

FACILITY:	ENVIRONMENTAL DATA SHEET ENVIRONMENTAL LABORATORY — DEPT. 330	
C - II		

A.O. 298K 143	ENV. TECH. R. K. Davis		TEST SCHED.
ENGINEER OR Q.C. M. Roger (E systems)	PHONE 973-4300 x248		TEST COMPLETED
TECHNICIAN	PHONE		TEST REMOVED
UNIT TITLE AN/TRN-41	SER.	QTY. 1	TOTAL UTILIZATION

INSTRUCTIONS TO OPERATOR	TEST TO TERMINATE:	BY:	ENVIRONMENTAL LABORATORY SUPERVISORS APPROVAL
TEST Sunshine SPEC. Mil-std 810 METH. Method 505.1	1. Test per procedure I, A. 10 Watts per ft² B Temp, 120°F C. Period Test 48 Hrs.		DWB SIGNATURE DATE

DATE	TIME	CHRONOLOGICAL RECORD OF TEST	INITIALS (PRINT)
5/11/77		Power Solar lamps, set Temp. to 120°F + stds,	DWB
5/16/77		Test Completed after 48 Hrs. chamber off	
		after Test Item Test.	

VERIFIED & RELEASED BY: _____ Q.C. OR PROGRESS _____ COGNIZANT ENGINEER